



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/634,296	08/04/2003	Michael Frank	PIX-P-041	7970

32566 7590 12/28/2006
PATENT LAW GROUP LLP
2635 NORTH FIRST STREET
SUITE 223
SAN JOSE, CA 95134

EXAMINER

CHU, RANDOLPH I

ART UNIT	PAPER NUMBER
----------	--------------

2624

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/28/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/634,296	Applicant(s) FRANK ET AL.	
	Examiner Randolph Chu	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 August 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. Figure 3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

2. The disclosure is objected to because of the following informalities: In pages 1 and 15 of specification, Application Serial No. are missing (under lined).

Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2624

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1 and 2 are rejected under 35 USC 103(a) as being unpatentable over Miller et al. (US 2005/0185055) in view of Shaw et al. (US 2003/0021488).

With respect claim 1, Miller et al. teaches an image sensor comprising a two-dimensional array of pixel elements, said image sensor outputting digital signals as pixel data representing an image of a scene (Fig 1A, 14; Fig. 5, 358; abstract); a frame buffer, in communication with said image sensor, coupled to store said pixel data provided by said image sensor (Fig. 5, 368); and a tone correction circuit coupled to receive pixel data from said frame buffer and compute tone corrected pixel data using one or more tone correction curves (Fig. 8, 530; Fig 9),

Miller et al. does not teach expressly that the tone correction circuit computes tone corrected pixel data for a first pixel by generating a pixel mask for an $m \times n$ neighborhood of pixels surrounding said first pixel, applying a blending mask of weight factors to said pixel mask and computing a selector value based on said pixel mask and weight factors associated with said blending mask, said selector value being used to derive a first tone correction curve for use to compute said tone corrected pixel data for said first pixel.

Shaw et al. teaches that the tone correction circuit computes tone corrected pixel data for a first pixel by generating a pixel mask for an $m \times n$ neighborhood of pixels

surrounding said first pixel, applying a blending mask of weight factors to said pixel mask and computing a selector value based on said pixel mask and weight factors associated with said blending mask, said selector value being used to derive a first tone correction curve for use to compute said tone corrected pixel data for said first pixel (abstract, para. [0012]).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to compute said tone corrected pixel data using weighted mask in the method of Miller et al.

The suggestion/motivation for doing so would have been that using weighted mask, image can reiteratively corrected by adjusting parameter of filter until a desired image quality is achieved

Therefore, it would have been obvious to combine Shaw et al. with Miller et al. to obtain the invention as specified in claim 1.

With respect claim 2, Miller et al. teaches that first tone correction curve comprises a selected one of said one or more tone correction curves (Fig. 9).

5. Claims 3 and 4 are rejected under 35 USC 103(a) as being unpatentable over Miller et al. (US 2005/0185055) in view of Shaw et al. (US 2003/0021488) and in further view of Kraft (US 2002/0141640).

Miller et al. in view of Shaw et al. discloses all the limitations of claim 1 as applied above from which claims 3 and 4 respectively depend.

With respect claim 3, Miller et al. in view of Shaw et al. does not teach expressly that first tone correction curve comprises a complex tone correction curve derived by blending a first one and a second one of said one or more tone correction curves based on said selector value.

Kraft teaches first tone correction curve comprises a complex tone correction curve derived by blending a first one and a second one of said one or more tone correction curves based on said selector value (para. [0197]-[0199]).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to blend first one and a second one of said one or more tone correction curves in the method of Miller et al. in view of Shaw et al.

The suggestion/motivation for doing so would have been that multiple tone correction filters can be applied at once with blended filter so that image processing can be efficiently processed.

Therefore, it would have been obvious to combine Kraft with Miller et al. in view of Shaw et al. to obtain the invention as specified in claim 3.

With respect claim 4, Miller et al. in view of Kraft with Miller et al. in view of Shaw et al. does not teach expressly one or more tone correction curves comprise a first tone correction curve for outdoor lighting condition and a second tone correction curve for indoor lighting condition.

Kraft teaches one or more tone correction curves comprise a first tone correction curve for outdoor lighting condition and a second tone correction curve for indoor lighting condition (para. [0097], [0203]).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use tone correction curve depend on lighting condition in the method of Miller et al. in view of Shaw et al.

The suggestion/motivation for doing so would have been that because of illumination characteristic, same object can be represented in different tone depend on lighting condition, so different tone correction filters is desirable for different light conditions.

Therefore, it would have been obvious to combine Kraft with Miller et al. in view of Shaw et al. to obtain the invention as specified in claim 4.

6. Claim 5 is rejected under 35 USC 103(a) as being unpatentable over Miller et al. (US 2005/0185055) in view of Shaw et al. (US 2003/0021488) and in further view of Tai (US 5,185,674).

Miller et al. in view of Shaw et al. discloses all the limitations of claim 1 as applied above from which claim 5 respectively depends.

Miller et al. in view of Shaw et al. does not teach expressly that comparing pixel data for each pixel in said mxn neighborhood of pixels with a threshold value, said pixel mask assigning a first value to a pixel when the pixel data of said pixel is less than said

threshold value and assigning a second value to a pixel when the pixel data of said pixel is greater than said threshold value.

Tai teaches comparing pixel data for each pixel in said $m \times n$ neighborhood of pixels with a threshold value, said pixel mask assigning a first value to a pixel when the pixel data of said pixel is less than said threshold value and assigning a second value to a pixel when the pixel data of said pixel is greater than said threshold value (col. 3. line 13 –col. 4 line 3).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to set value of the pixel according to the threshold in the method of Miller et al. in view of Shaw et al.

The suggestion/motivation for doing so would have been that image tone value can be set depend to different criteria to optimize image quality.

Therefore, it would have been obvious to combine Tai with Miller et al. in view of Shaw et al. to obtain the invention as specified in claim 5.

7. Claim 6 is rejected under 35 USC 103(a) as being unpatentable over Miller et al. (US 2005/0185055) in view of Shaw et al. (US 2003/0021488) and in further view of Goto et al. (US 2003/0133607).

Miller et al. in view of Shaw et al. discloses all the limitations of claim 1 as applied above from which claim 6 respectively depends.

Miller et al. in view of Shaw et al. does not teach expressly that said blending mask implements a two dimensional low pass filter.

Goto et al. teaches said blending mask implements a two dimensional low pass filter (col. 3. line 13 –col. 4 line 3).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use low pass filter in the method of Miller et al. in view of Shaw et al.

The suggestion/motivation for doing so would have been that to soften a portion near the boundary of the color region and moderating collapsing of the continuity of the color region.

Therefore, it would have been obvious to combine Goto et al. with Miller et al. in view of Shaw et al. to obtain the invention as specified in claim 6.

8. Claim 7 is rejected under 35 USC 103(a) as being unpatentable over Miller et al. (US 2005/0185055) in view of Shaw et al. (US 2003/0021488) and in further view of Uchino et al. (US 6,813,040).

Miller et al. in view of Shaw et al. discloses all the limitations of claim 1 as applied above from which claim 7 respectively depends.

Miller et al. in view of Shaw et al. does not teach expressly that $m \times n$ neighborhood of pixels comprises a $m \times m$ neighborhood of pixels.

Uchino et al. teaches $m \times n$ neighborhood of pixels comprises a $m \times m$ neighborhood of pixels (Fig 15, ref label. 27 and 28).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use $m \times m$ filter in the method of Miller et al. in view of Shaw et al.

The suggestion/motivation for doing so would have been that it is simple and mask is equally distributed from pixel of interest.

Therefore, it would have been obvious to combine Uchino et al. with Miller et al. in view of Shaw et al. to obtain the invention as specified in claim 7.

9. Claims 8 is rejected under 35 USC 103(a) as being unpatentable over Miller et al. (US 2005/0185055) in view of Shaw et al. (US 2003/0021488) and Tai (US 5,185,674).

Miller et al. teaches generating digital pixel data representative of an image of a scene using an image sensor, said image sensor comprising a two-dimensional array of pixel elements(Fig 1A, 14; Fig. 5, 358; abstract); storing said digital pixel data in a frame buffer(Fig. 5, 368); providing a plurality of tone correction curves; deriving a first tone correction curve from said plurality of tone correction curves based on said selector value for use to compute said tone corrected pixel data for said first pixel (Fig. 9);

Tai teaches that, for a first pixel in said image, selecting an mxn neighborhood of pixels surrounding said first pixel; generating a pixel mask for said mxn neighborhood of pixels, said pixel mask including a first value to indicate a pixel in said mxn neighborhood of pixels having a pixel value greater than a threshold value and said pixel mask including a second value to indicate a pixel in said mxn neighborhood of pixels having a pixel value smaller than said threshold value(col. 3. line 13 –col. 4 line 3);

Shaw et al. teaches providing a blending mask including weight factors; applying said blending mask to said pixel mask; computing a selector value based on said pixel mask and weight factors associated with said blending mask (abstract, para. [0012]).;

At the time of the invention it would have been obvious to a person of ordinary skill in the art to compute said tone corrected pixel data using weighted mask and to set value of the pixel according to the threshold in the method of Miller et al.

The suggestion/motivation for doing so would have been that using weighted mask, image can reiteratively corrected by adjusting parameter of filter until a desired image quality is achieved and also image tone value can be set depend to different criteria to optimize image quality.

Therefore, it would have been obvious to combine Shaw et al., Miller et al. and Tai to obtain the invention as specified in claim 8.

With respect claim 9, please refer to rejection for claim 2.

With respect claim 10, please refer to rejection for claim 3.

With respect claim 11, please refer to rejection for claim 4.

With respect claim 12, please refer to rejection for claim 5.

With respect claim 13, please refer to rejection for claim 6.

With respect claim 14, please refer to rejection for claim 7.

Conclusion

Art Unit: 2624

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Randolph Chu whose telephone number is 571-270-1145. The examiner can normally be reached on Monday to Thursday from 7:30 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Mancuso can be reached on 571-272-7695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RIC/



JOSEPH MANCUSO
SUPERVISORY PATENT EXAMINER